CLAIM AMENDMENTS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (original). Apparatus for constructing a multi-channel output signal using an input signal and parametric side information, the input signal including a first input channel and a second input channel derived from an original multi-channel signal, the original multi-channel signal having a plurality of channels, the plurality of channels including at least two original channels, which are defined as being located at one side of an assumed listener position, wherein a first original channel is a first one of the at least two original channels, and wherein a second original channel is a second one of the at least two original channels, and the parametric side information describing interrelations betweens original channels of the multi-channel original signal, comprising:

means for determining a first base channel by selecting one of the first and the second input channels or a combination of the first and the second input channels, and for determining a second base channel by selecting the other of the first and the second input channels or a different combination of the first and the second input channels, such that the second base channel is different from the first base channel; and

means for synthesizing a first output channel using the parametric side information and the first base channel to obtain a first synthesized output channel which is a reproduced version of the first original channel which is located at the one side of the assumed listener position, and for synthesizing a second output channel using the parametric side information and the second base channel, the second output channel being a reproduced version of the second original channel which is located at the same side of the assumed listener position.

Claim 2 (original). Apparatus in accordance with claim 1, further comprising:

means for providing a coherence measure, the coherence measure depending on a coherence between a first original channel and a second original channel, the first and the second original channels being included in an original multi-channel signal;

in which the means for determining is operative to determine the first and the second base channels different from each other based on the coherence measure.

Claim 3 (original). Apparatus in accordance with claim 1, in which the at least two original channels include a left original channel and a left surround original channel or a right original channel and a right surround original channel.

Claim 4 (original). Apparatus in accordance with claim 1, in which a combination of the first and the second input channels determined to be the second base channel is such that one of the two input channels contributes to the second base channel more than the other input channel.

Claim 5 (original). Apparatus in accordance with claim 2, in which the coherence measure is time-varying such that the means for determining is operative to determine the second base channel as a combination of the first input channel and the second input channel, the combination being variable over time.

Claim 6 (original). Apparatus in accordance with claim 1, in which parametric side information includes the coherence measure, the coherence measure being determined using the first original channel and the second original channel, wherein the means for providing is operative to extract the coherence measure from the parametric side information.

Claim 7 (original). Apparatus in accordance with claim 6, in which the input signal has a sequence of frames and the-parametric side information includes a sequence of parameters including the coherence measure, the parameters being associated with the frames.

Claim 8 (original). Apparatus in accordance with claim 1, in which the original signal further includes a center channel, and in which the means for

determining is further operative to calculate a third base channel using the first input channel and the second input channel in equal portions.

Claim 9 (original). Apparatus in accordance with claim 1, in which the parametric side information are frequency dependent and the means for synthesizing are operative to perform a frequency-dependent synthesis.

Claim 10 (original). Apparatus in accordance with claim 1, in which the parametric side information include binaural cue coding (ECC) parameters including inter-channel level difference parameters and inter-channel time delay parameters, and in which the means for synthesizing is operative to perform a BCC synthesis using a base channel determined by the means for determining when synthesizing an output channel.

Claim 11 (currently amended). Apparatus in accordance with ~~claim 1~~ claim 2, in which the means for determining is operative to determine the first base channel as one of the first and second input channels and to determine the second base channel as a weighted combination of the first and the second input channels, a weighting factor depending on the coherence measure.

Claim 12 (currently amended). Apparatus in accordance with ~~claim 1~~ claim 11, in which the weighting factor is determined as follows:

$$\alpha_{1;2} = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A},$$

wherein α is the weighting factor, and wherein A, B, C are determined as follows,

$A=C^2-K^2IR$ $B=2LC\ (1-K^2)$ $C= L^2\ (1-K^2)$

wherein L, R, C are determined as follows,

$$L = \sum l^2 \qquad R = \sum r^2 \qquad C = \sum l \cdot r$$

and wherein k is the coherence measure, and wherein 1 is the first input channel and r is the second input channel.

Claim 13 (original). Apparatus in accordance with claim 11, in which the coherence measure is given for a frequency band, and in which the means for determining is operative to determine the second base channel for the frequency band.

Claim 14 (original). Apparatus in accordance with claim 11, in which the coherence measure is determined as follows:

$$cc(x,y)=\frac{\sum x\cdot y}{\sqrt{\sum x^2}\cdot\sqrt{\sum y^2}}$$

wherein cc(x,y) is the coherence measure between two original channels x, y, wherein x_i is a sample at a time instance i of the first original channel, and wherein y_i is a sample at a time instance i of the second original channel.

Claim 15 (original). Apparatus in accordance with claim 1, in which the means for determining is operative to scale the output channels using power measures derived from the original channels, the power measures being transmitted within the parametric side information.

Claim 16 (original). Apparatus in accordance with claim 11, in which the means for determining is operative to smooth the weighting factor over time and/or frequency.

Claim 17 (original). Apparatus in accordance with claim 1, in which the parametric side information include level information representing an energy distribution of the original channels in the original signal, and wherein the means for synthesizing is operative to scale the output channels such that a sum of the energies of the output channels is equal to a sum of the energies of the first input channel and the second input channel.

Claim 18 (original). Apparatus in accordance with claim 17, in which the means

for synthesizing is operative to calculate raw output channels based on determined base channels and the level information and to scale the raw output channels such that a total energy of scaled raw output channels is equal to a total energy of the first and the second input channels.

Claim 19 (original). Apparatus in accordance with claim 1, in which the input signal includes a left channel and a right channel, and the original channel includes a front left channel, a left surround channel, a front right channel and a right surround channel, and in which the means for determining is operative to determine

the left channel as the base channel for a synthesis of the front left channel,

the right channel is the base channel for a synthesis of the front right channel,

a combination of the left channel and the right channel as the base channel for the left surround channel or the right surround channel.

Claim 20 (original). Apparatus in accordance with claim 1, in which the input signal includes a left channel and a right channel and the original signal includes a front left channel, a left surround channel, a front right channel and a right surround channel, and in which the means for determining is operative to

determine the left channel as the base channel for a synthesis of the front left channel, the right channel as the base channel for a synthesis of the right surround channel, and a combination of the first and the second input channels as the base channel for a synthesis of the front right channel or the left surround channel.

Claim 21 (original). Method of constructing a multi-channel output signal using an input signal and parametric side information, the input signal including a first input channel and a second input channel derived from an original multi-channel signal, the original multi-channel signal having a plurality of channels, the plurality of channels including at least two original channels, which are defined as being located at one side of an assumed listener position, wherein a first original channel is a first one of the at least two original channels, and wherein a second original channel is a second one of the at least two original channels, and the parametric side information describing interrelations betweens original channels of the multi-channel original signal, comprising: determining a first base channel by selecting one of the first and the second input channels or a combination of the first and the second input channels, and determining a second base channel by selecting the other of the first and the second input channels or a different combination of the first and the second input channels, such that the second base channel is different from the first base channel; and synthesizing a first output channel using the parametric side information and the first base channel to obtain a first synthesized output channel which is a reproduced version of the first original channel which is

located at the one side of the assumed listener position, and synthesizing a second output channel using the parametric side information and the second base channel, the second output channel being a reproduced version of the second original channel which is located at the same side of the assumed listener position.

Claim 22 (original). Apparatus for generating a downmix signal from a multi-channel original signal, the downmix signal having a number of channels being smaller than a number of original channels, comprising:

means for calculating a first downmix channel and a second downmix channel using a downmix rule;

means for calculating parametric level information representing an energy distribution among the channels in the multi-channel original signal;

means for determining a coherence measure between two original channels, the two original channels being located at one side of an assumed listener position; and

means for forming an output signal using the first and the second downmix channels, the parametric level information and only at least one coherence measure between two original channels located at the one side or a value derived from the at least one coherence measure, but not using any coherence

measure between channels located at different sides of the assumed listener position.

Claim 23 (original). Apparatus in accordance with claim 22, further comprising means for determining time delay information between two original channels located at one side of the assumed listener position; and

wherein the means for forming is operative to only include time level information between two original channels located at one side of the assumed listener position but not time level information between two original channels located at different sides of the assumed listener position.

Claim 24 (original). Method of generating a downmix signal from a multi-channel original signal, the downmix signal having a number of channels being smaller than a number of original channels, comprising: calculating a first downmix channel and a second downmix channel using a downmix rule; calculating parametric level information representing an energy distribution among the channels in the multi-channel original signal; determining a coherence measure between two original channels, the two original channels being located at one side of an assumed listener position; and forming an output signal using the first and the second downmix channels, the parametric level information and only at least one coherence measure between two original channels located at the one side or a value derived from the at least one coherence measure, but not using any coherence measure between

channels located at different sides of the assumed listener position.

Claim 25 (original). Computer program having a program code for performing a method of constructing a multi-channel output signal using an input signal and parametric side information, the input signal including a first input channel and a second input channel derived from an original multi-channel signal, the original multi-channel signal having a plurality of channels, the plurality of channels including at least two original channels, which are defined as being located at one side of an assumed listener position, wherein a first original channel is a first one of the at least two original channels, and wherein a second original channel is a second one of the at least two original channels, and the parametric side information describing interrelations betweens original channels of the multi-channel original signal, comprising: determining a first base channel by selecting one of the first and the second input channels or a combination of the first and the second input channels, and determining a second base channel by selecting the other of the first and the second input channels or a different combination of the first and the second input channels, such that the second base channel is different from the first base channel; and synthesizing a first output channel using the parametric side information and the first base channel to obtain a first synthesized output channel which is a reproduced version of the first original channel which is located at the one side of the assumed listener position, and synthesizing a second output channel using the parametric side information and the second base channel, the second output channel being a reproduced version of the second original channel

which is located at the same side of the assumed listener position.

Claim 26 (original). Computer program having a program code for performing a method of generating a downmix signal from a multi-channel original signal, the downmix signal having a number of channels being smaller than a number of original channels, comprising: calculating a first downmix channel and a second downmix channel using a downmix rule; calculating parametric level information representing an energy distribution among the channels in the multi-channel original signal; determining a coherence measure between two original channels, the two original channels being located at one side of an assumed listener position; and forming an output signal using the first and the second downmix channels, the parametric level information and only at least one coherence measure between two original channels located at the one side or a value derived from the at least one coherence measure, but not using any coherence measure between channels located at different sides of the assumed listener position.